FAST FACTS
ETHYLENE GLYCOL

Missouri Department of Health
Hazardous Substance Emergency Events Surveillance (HSEES) Program

Synonyms: 1,2-Ethanediol
1,2-dihydroxyethane
Glycol alcohol
Fridex

CAS Number: 107-21-1

DOT Numbers: N/A

DOT Designation: N/A

Hazard Rating	NFPA
HEALTH	1
FLAMMABILITY	1
REACTIVITY	0
• Containers may explode in fire • Poisonous gasses are produced in fire	

Hazard Rating Key:
0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

Exposure Levels

- Mild throat irritation may result from exposure of 28 mg/m^3*. Levels above 140 mg/m^3 result in more marked irritation, with levels of more than 250 mg/m^3 being unbreathable. These levels are only reached at elevated temperatures.
- Accidental eye contact with concentrated ethylene glycol may result in extreme swelling of the eye, cloudy vision and slow response to light. These symptoms may last up to a month.
- If ingested, ethylene glycol may cause symptoms in the nervous system, heart, lungs and kidneys. The earliest effects are usually felt in the nervous system between 1/2 to 12 hours after ingestion. Symptoms from one liquid ounce may include nausea, vomiting, dizziness, loss of coordination and abdominal pain.
- Ingestion of large amounts may cause stupor, coma, convulsions and death. Survival of this stage may lead to development of rapid heartbeat, enlarged heart and fluid in the lungs, which can also lead to death, usually after one to three days.

Characteristics and Potential Exposures

Ethylene glycol is a colorless, odorless, syrupy liquid. Because of its physical properties, ethylene glycol is used in antifreeze, hydraulic fluids, electrolytic condensers and heat exchangers. It is also used as an industrial solvent and as a chemical intermediate for ethylene glycol dinitrate, glycol esters, resins, and for pharmaceuticals.

Ethylene Glycol Releases in Missouri

During calendar years 1994-1998, 1,071 HSEES events were reported in Missouri. Of those, 42 events involved ethylene glycol. Quantities released ranged from 32 ounces to 2,278 gallons, and from 1 to 5,000 pounds. Fixed facilities were involved in 27 of these events, while 15 occurred during transport. No injuries or evacuations occurred as a result of the release of ethylene glycol during this five-year period.

Interesting Event

A tanker truck was offloading ethylene glycol into a 1,000 gallon capacity above ground storage tank (AST) at a chemical distribution facility. The AST had two delivery valves – one for tanker truck deliveries and another for delivery from railroad tank cars. The rail head valve was located a short distance from the tank and not right by the tank, as is the truck delivery valve. The rail head valve was not properly closed. The truck driver offloaded over 2,000 gallons of ethylene glycol before he realized that the product was leaking. A total of 2,278 gallons was released.

Approximately 1,500 gallons were contained in a small containment area and slop tank; however, the remaining product spilled over the containment wall, ran across a paved lot and into a nearby storm drain. It was estimated that 500 gallons entered the storm drain. Fortunately, the storm drain was part of a combined storm/sanitary sewer system and led to a public water treatment facility. Access to the storm sewer was closed off, and a vacuum truck was brought in to pump out the remaining product. The storm drain was then washed and all remaining residue was pumped from the system.

* mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

Health Hazard Information

- Exposure to ethylene glycol can irritate the nose, throat and skin.
- Ethylene glycol splashed into the eyes may result in extreme swelling of the eye, cloudy vision and slow response to light.
- Ingestion may cause dizziness, loss of coordination, nausea and vomiting, stomach pain and headache.

Personal Protective Equipment Guidelines

- Avoid skin contact with ethylene glycol. Wear protective gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most appropriate glove/clothing for your operation.
- Wear splash proof chemical goggles and a faceshield or airtight gas proof goggles when working with ethylene glycol, unless full facepiece respiratory protection is worn.
- When the potential exists for exposures over 50 parts per million (ppm), use National Institute for Occupational Safety and Health (NIOSH) approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode.

Handling and Storage

- Ethylene glycol must be stored to avoid contact with strong bases (such as sodium hydroxide and potassium hydroxide), acids, and oxidizing agents (such as chlorates, nitrates, perchlorates, peroxides, permanganates, chlorine, bromine and fluorine) since violent reactions occur.
- Store ethylene glycol in tightly closed containers in a cool, well-ventilated area.

Spills and Emergencies

- Most environmental emergencies involve spills of hazardous materials that must be reported to the Department of Natural Resources through a 24-hour hotline (573-634-2436). When reporting a spill, callers can also obtain technical assistance regarding response, containment and cleanup of hazardous materials.
- Restrict persons not wearing protective equipment from areas of spills or leaks until cleanup is complete.
- Remove all ignition sources.
- Ventilate the area of the spill or leak.
- Spread absorbent material on the liquid. Shovel or scoop the material into containers for disposal.

Disposal Methods

Incineration is the method recommended for disposal. As an alternative, ethylene glycol can be recovered from polyester plant wastes.

Fire Extinguishing

- Ethylene glycol is a combustible liquid.
- Poisonous gasses are produced in fire.
- Containers may explode in fire.
- Use dry chemical, $C0_2$, water spray, or alcohol foam extinguishers.
- Use water spray to keep fire-exposed containers cool.
- Vapors may travel to a source of ignition and flash back.

Emergency First Aid Measures

Eye Contact

- Immediately flush with large amounts of water. Continue for at least 15 minutes, occasionally lifting upper and lower lids.

Skin Contact

- Quickly remove contaminated clothing. Immediately wash skin with large amounts of soap and water.

Respiratory

- Remove the victim from the site of the release.
- Begin rescue breathing if breathing has stopped, and CPR if heart activity has stopped.
- Transfer the victim promptly to a medical facility.

For more information on the Missouri HSEES program, please contact the HSEES Coordinator at 573-751-9071.

Information for this fact sheet was obtained from the Missouri HSEES Program Five-Year Data Analysis; the Environmental Protection Agency (EPA); the Agency for Toxic Substances and Disease Registry (ATSDR); and the Handbook of Toxic and Hazardous Chemicals and Carcinogens, Third Edition.

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